



SEQUENCE LISTING

<110> CALIFORNIA INSTITUTE OF TECHNOLOGY
COPE, Gregory
VERMA, Rati
ARAVIND, L.
KOONIN, Eugene V.
DESHAIES, Raymond
AMBROGGIO, Xavier

<120> REGULATION OF TARGET PROTEIN ACTIVITY THROUGH MODIFIER PROTEINS

<130> JHU1510-4

<140> US 10/047,253
<141> 2002-01-14

<150> US 60/261,314
<151> 2001-01-12

<150> US 60/322,322
<151> 2001-09-14

<150> US 60/322,030
<151> 2001-09-14

<160> 24

<170> PatentIn version 3.3

<210> 1
<211> 14
<212> PRT
<213> Artificial sequence

<220>
<223> JAM domain

<220>
<221> MISC_FEATURE
<222> (1)..(14)
<223> Xaa is any amino acid

<400> 1

His Xaa His Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asp
1 5 10

<210> 2
<211> 17
<212> PRT
<213> Artificial sequence

<220>
<223> JAM domain

<220>
<221> MISC_FEATURE

<222> (3)..(3)
 <223> Xaa is Tyr or Ile

<220>
 <221> MISC_FEATURE
 <222> (5)..(5)
 <223> Xaa is Ser or Thr

<220>
 <221> MISC_FEATURE
 <222> (8)..(16)
 <223> Xaa is any amino acid

<400> 2

Gly Trp Xaa His Xaa His Pro Xaa Xaa Xaa Xaa Xaa Ser Xaa Xaa
 1 5 10 15

Asp

<210> 3
 <211> 246
 <212> PRT
 <213> Homo sapiens

<400> 3

Thr Met Ile Ile Met Asp Ser Phe Ala Leu Pro Val Glu Gly Thr Glu
 1 5 10 15

Thr Arg Val Asn Ala Gln Ala Ala Ala Tyr Glu Tyr Met Ala Ala Tyr
 20 25 30

Ile Glu Asn Ala Lys Gln Val Gly Arg Leu Glu Asn Ala Ile Gly Trp
 35 40 45

Tyr His Ser His Pro Gly Tyr Gly Cys Trp Leu Ser Gly Ile Asp Val
 50 55 60

Ser Thr Gln Met Leu Asn Gln Gln Phe Gln Glu Pro Phe Val Ala Val
 65 70 75 80

Val Ile Asp Pro Thr Arg Thr Ile Ser Ala Gly Lys Val Asn Leu Gly
 85 90 95

Ala Phe Arg Thr Tyr Pro Lys Gly Tyr Lys Pro Pro Asp Glu Gly Pro
 100 105 110

Ser Glu Tyr Gln Thr Ile Pro Leu Asn Lys Ile Glu Asp Phe Gly Val
 115 120 125

His Cys Lys Gln Tyr Tyr Ala Leu Glu Val Ser Tyr Phe Lys Ser Ser
 130 135 140

Leu Asp Arg Lys Leu Leu Glu Leu Leu Trp Asn Lys Tyr Trp Val Asn
 145 150 155 160

Thr Leu Ser Ser Ser Ser Leu Leu Thr Asn Ala Asp Tyr Thr Thr Gly
 165 170 175

Gln Val Phe Asp Leu Ser Glu Lys Leu Glu Gln Ser Glu Ala Gln Leu
 180 185 190

Gly Arg Gly Ser Phe Met Leu Gly Leu Glu Thr His Asp Arg Lys Ser
 195 200 205

Glu Asp Lys Leu Ala Lys Ala Thr Arg Asp Ser Cys Lys Thr Thr Ile
 210 215 220

Glu Ala Ile His Gly Leu Met Ser Gln Val Ile Lys Asp Lys Leu Phe
 225 230 235 240

Asn Gln Ile Asn Ile Ser
 245

<210> 4
 <211> 245
 <212> PRT
 <213> Homo sapiens

<400> 4

Thr Val Arg Val Ile Asp Val Phe Ala Met Pro Gln Ser Gly Thr Gly
 1 5 10 15

Val Ser Val Glu Ala Val Asp Pro Val Phe Gln Ala Lys Met Leu Asp
 20 25 30

Met Leu Lys Gln Thr Gly Arg Pro Glu Met Val Val Gly Trp Tyr His
 35 40 45

Ser His Pro Gly Phe Gly Cys Trp Leu Ser Gly Val Asp Ile Asn Thr
 50 55 60

Gln Gln Ser Phe Glu Ala Leu Ser Glu Arg Ala Val Ala Val Val Val
 65 70 75 80

Asp Pro Ile Gln Ser Val Lys Gly Lys Val Val Ile Asp Ala Phe Arg

85

90

95

Leu Ile Asn Ala Asn Met Met Val Leu Gly His Glu Pro Arg Gln Thr
 100 105 110

Thr Ser Asn Leu Gly His Leu Asn Lys Pro Ser Ile Gln Ala Leu Ile
 115 120 125

His Gly Leu Asn Arg His Tyr Tyr Ser Ile Thr Ile Asn Tyr Arg Lys
 130 135 140

Asn Glu Leu Glu Gln Lys Met Leu Leu Asn Leu His Lys Lys Ser Trp
 145 150 155 160

Met Glu Gly Leu Thr Leu Gln Asp Tyr Ser Glu His Cys Lys His Asn
 165 170 175

Glu Ser Val Val Lys Glu Met Leu Glu Leu Ala Lys Asn Tyr Asn Lys
 180 185 190

Ala Val Glu Glu Glu Asp Lys Met Thr Pro Glu Gln Leu Ala Ile Lys
 195 200 205

Asn Val Gly Lys Gln Asp Pro Lys Arg His Leu Glu Glu His Val Asp
 210 215 220

Val Leu Met Thr Ser Asn Ile Val Gln Cys Leu Ala Ala Met Leu Asp
 225 230 235 240

Thr Val Val Phe Lys
 245

<210> 5
 <211> 421
 <212> PRT
 <213> Homo sapiens

<400> 5

Met Pro Asp His Thr Asp Val Ser Leu Ser Pro Glu Glu Arg Val Arg
 1 5 10 15

Ala Leu Ser Lys Leu Gly Cys Asn Ile Thr Ile Ser Glu Asp Ile Thr
 20 25 30

Pro Arg Arg Tyr Phe Arg Ser Gly Val Glu Met Glu Arg Met Ala Ser
 35 40 45

Val	Tyr	Leu	Glu	Glu	Gly	Asn	Leu	Glu	Asn	Ala	Phe	Val	Leu	Tyr	Asn	
50						55					60					
Lys	Phe	Ile	Thr	Leu	Phe	Val	Glu	Lys	Leu	Pro	Asn	His	Arg	Asp	Tyr	
65					70					75					80	
Gln	Gln	Cys	Ala	Val	Pro	Glu	Lys	Gln	Asp	Ile	Met	Lys	Lys	Leu	Lys	
				85					90					95		
Glu	Ile	Ala	Phe	Pro	Arg	Thr	Asp	Glu	Leu	Lys	Asn	Asp	Leu	Leu	Lys	
			100					105					110			
Lys	Tyr	Asn	Val	Glu	Tyr	Gln	Glu	Tyr	Leu	Gln	Ser	Lys	Asn	Lys	Tyr	
		115					120					125				
Lys	Ala	Glu	Ile	Leu	Lys	Lys	Leu	Glu	His	Gln	Arg	Leu	Ile	Glu	Ala	
	130					135					140					
Glu	Arg	Lys	Arg	Ile	Ala	Gln	Met	Arg	Gln	Gln	Gln	Leu	Glu	Ser	Glu	
145					150					155					160	
Gln	Phe	Leu	Phe	Phe	Glu	Asp	Gln	Leu	Lys	Lys	Gln	Glu	Leu	Ala	Arg	
				165					170					175		
Gly	Gln	Met	Arg	Ser	Gln	Gln	Thr	Ser	Gly	Leu	Ser	Glu	Gln	Ile	Asp	
			180					185					190			
Gly	Ser	Ala	Leu	Ser	Cys	Phe	Ser	Thr	His	Gln	Asn	Asn	Ser	Leu	Leu	
		195					200					205				
Asn	Val	Phe	Ala	Asp	Gln	Pro	Asn	Lys	Ser	Asp	Ala	Thr	Asn	Tyr	Ala	
	210					215					220					
Ser	His	Ser	Pro	Pro	Val	Asn	Arg	Ala	Leu	Thr	Pro	Ala	Ala	Thr	Leu	
225					230					235					240	
Ser	Ala	Val	Gln	Asn	Leu	Val	Val	Glu	Gly	Leu	Arg	Cys	Val	Val	Leu	
				245					250					255		
Pro	Glu	Asp	Leu	Cys	His	Lys	Phe	Leu	Gln	Leu	Ala	Glu	Ser	Asn	Thr	
			260					265					270			
Val	Arg	Gly	Ile	Glu	Thr	Cys	Gly	Ile	Leu	Cys	Gly	Lys	Leu	Thr	His	
		275					280					285				

Asn Glu Phe Thr Ile Thr His Val Ile Val Pro Lys Gln Ser Ala Gly
 290 295 300

Pro Asp Tyr Cys Asp Met Glu Asn Val Glu Glu Leu Phe Asn Val Gln
 305 310 315 320

Asp Gln His Asp Leu Leu Thr Leu Gly Trp Ile His Thr His Pro Thr
 325 330 335

Gln Thr Ala Phe Leu Ser Ser Val Asp Leu His Thr His Cys Ser Tyr
 340 345 350

Gln Leu Met Leu Pro Glu Ala Ile Ala Ile Val Cys Ser Pro Lys His
 355 360 365

Lys Asp Thr Gly Ile Phe Arg Leu Thr Asn Ala Gly Met Leu Glu Val
 370 375 380

Ser Ala Cys Lys Lys Lys Gly Phe His Pro His Thr Lys Glu Pro Arg
 385 390 395 400

Leu Phe Ser Ile Cys Lys His Val Leu Val Lys Asp Ile Lys Ile Ile
 405 410 415

Val Leu Asp Leu Arg
 420

<210> 6
 <211> 461
 <212> PRT
 <213> Homo sapiens

<400> 6

Met Asp Gln Pro Phe Thr Val Asn Ser Leu Lys Lys Leu Ala Ala Met
 1 5 10 15

Pro Asp His Thr Asp Val Ser Leu Ser Pro Glu Glu Arg Val Arg Ala
 20 25 30

Leu Ser Lys Leu Gly Cys Asn Ile Thr Ile Ser Glu Asp Ile Thr Pro
 35 40 45

Arg Arg Tyr Phe Arg Ser Gly Val Glu Met Glu Arg Met Ala Ser Val
 50 55 60

Tyr Leu Glu Glu Gly Asn Leu Glu Asn Ala Phe Val Leu Tyr Asn Lys
 65 70 75 80

Phe Ile Thr Leu Phe Val Glu Lys Leu Pro Asn His Arg Asp Tyr Gln
 85 90 95

Gln Cys Ala Val Pro Glu Lys Gln Asp Ile Met Lys Lys Leu Lys Glu
 100 105 110

Ile Ala Phe Pro Arg Thr Asp Glu Leu Lys Asn Asp Leu Leu Lys Lys
 115 120 125

Tyr Asn Val Glu Tyr Gln Glu Tyr Leu Gln Ser Lys Asn Lys Tyr Lys
 130 135 140

Ala Glu Ile Leu Lys Lys Leu Glu His Gln Arg Leu Ile Glu Ala Glu
 145 150 155 160

Arg Lys Arg Ile Ala Gln Met Arg Gln Gln Gln Leu Glu Ser Glu Gln
 165 170 175

Phe Leu Phe Phe Glu Asp Gln Leu Lys Lys Gln Glu Leu Ala Arg Gly
 180 185 190

Gln Met Arg Ser Gln Gln Thr Ser Gly Leu Ser Glu Gln Ile Asp Gly
 195 200 205

Ser Ala Leu Ser Cys Phe Ser Thr His Gln Asn Asn Ser Leu Leu Asn
 210 215 220

Val Phe Ala Asp Gln Pro Asn Lys Ser Asp Ala Thr Asn Tyr Ala Ser
 225 230 235 240

His Ser Pro Pro Val Asn Arg Ala Leu Thr Pro Ala Ala Thr Leu Ser
 245 250 255

Ala Val Gln Asn Leu Val Val Glu Gly Leu Arg Cys Val Val Leu Pro
 260 265 270

Glu Asp Leu Cys His Lys Phe Leu Gln Leu Ala Glu Ser Asn Thr Val
 275 280 285

Arg Gly Ile Glu Thr Cys Gly Ile Leu Cys Gly Lys Leu Thr His Asn
 290 295 300

Glu Phe Thr Ile Thr His Val Ile Val Pro Lys Gln Ser Ala Gly Pro
 305 310 315 320

Asp Tyr Cys Asp Met Glu Asn Val Glu Glu Leu Phe Asn Val Gln Asp
 325 330 335

Gln His Asp Leu Leu Thr Leu Gly Trp Ile His Thr His Pro Thr Gln
 340 345 350

Thr Ala Phe Leu Ser Ser Val Asp Leu His Thr His Cys Ser Tyr Gln
 355 360 365

Leu Met Leu Pro Glu Ala Ile Ala Ile Val Cys Ser Pro Lys His Lys
 370 375 380

Asp Thr Gly Ile Phe Arg Leu Thr Asn Ala Gly Met Leu Glu Val Ser
 385 390 395 400

Ala Cys Lys Lys Lys Gly Phe His Pro His Thr Lys Glu Pro Arg Leu
 405 410 415

Phe Ser Ile Gln Lys Phe Leu Ser Gly Ile Ile Ser Gly Thr Ala Leu
 420 425 430

Glu Met Glu Pro Leu Lys Ile Gly Tyr Gly Pro Asn Gly Phe Pro Leu
 435 440 445

Leu Gly Ile Ser Arg Ser Ser Ser Pro Ser Glu Gln Leu
 450 455 460

<210> 7
 <211> 424
 <212> PRT
 <213> Homo sapiens

<400> 7

Met Ser Asp His Gly Asp Val Ser Leu Pro Pro Glu Asp Arg Val Arg
 1 5 10 15

Ala Leu Ser Gln Leu Gly Ser Ala Val Glu Val Asn Glu Asp Ile Pro
 20 25 30

Pro Arg Arg Tyr Phe Arg Ser Gly Val Glu Ile Ile Arg Met Ala Ser
 35 40 45

Ile Tyr Ser Glu Glu Gly Asn Ile Glu His Ala Phe Ile Leu Tyr Asn
 50 55 60

Lys Tyr Ile Thr Leu Phe Ile Glu Lys Leu Pro Lys His Arg Asp Tyr

65		70		75		80									
Lys	Ser	Ala	Val	Ile	Pro	Glu	Lys	Lys	Asp	Thr	Val	Lys	Lys	Leu	Lys
			85						90					95	
Glu	Ile	Ala	Phe	Pro	Lys	Ala	Glu	Glu	Leu	Lys	Ala	Glu	Leu	Leu	Lys
			100					105					110		
Arg	Tyr	Thr	Lys	Glu	Tyr	Thr	Glu	Tyr	Asn	Glu	Glu	Lys	Lys	Lys	Glu
		115					120					125			
Ala	Glu	Glu	Leu	Ala	Arg	Asn	Met	Ala	Ile	Gln	Gln	Glu	Leu	Glu	Lys
	130					135						140			
Glu	Lys	Gln	Arg	Val	Ala	Gln	Gln	Lys	Gln	Gln	Gln	Leu	Glu	Gln	Glu
145					150					155					160
Gln	Phe	His	Ala	Phe	Glu	Glu	Met	Ile	Arg	Asn	Gln	Glu	Leu	Glu	Lys
				165					170					175	
Glu	Arg	Leu	Lys	Ile	Val	Gln	Glu	Phe	Gly	Lys	Val	Asp	Pro	Gly	Leu
			180					185					190		
Gly	Gly	Pro	Leu	Val	Pro	Asp	Leu	Glu	Lys	Pro	Ser	Leu	Asp	Val	Phe
		195					200					205			
Pro	Thr	Leu	Thr	Val	Ser	Ser	Ile	Gln	Pro	Ser	Asp	Cys	His	Thr	Thr
	210					215					220				
Val	Arg	Pro	Ala	Lys	Pro	Pro	Val	Val	Asp	Arg	Ser	Leu	Lys	Pro	Gly
225					230					235					240
Ala	Leu	Ser	Asn	Ser	Glu	Ser	Ile	Pro	Thr	Ile	Asp	Gly	Leu	Arg	His
			245						250					255	
Val	Val	Val	Pro	Gly	Arg	Leu	Cys	Pro	Gln	Phe	Leu	Gln	Leu	Ala	Ser
			260					265					270		
Ala	Asn	Thr	Ala	Arg	Gly	Val	Glu	Thr	Cys	Gly	Ile	Leu	Cys	Gly	Lys
		275					280					285			
Leu	Met	Arg	Asn	Glu	Phe	Thr	Ile	Thr	His	Val	Leu	Ile	Pro	Lys	Gln
	290					295					300				
Ser	Ala	Gly	Ser	Asp	Tyr	Cys	Asn	Thr	Glu	Asn	Glu	Glu	Glu	Leu	Phe
305					310					315					320

Leu Ile Gln Asp Gln Gln Gly Leu Ile Thr Leu Gly Trp Ile His Thr
 325 330 335

His Pro Thr Gln Thr Ala Phe Leu Ser Ser Val Asp Leu His Thr His
 340 345 350

Cys Ser Tyr Gln Met Met Leu Pro Glu Ser Val Ala Ile Val Cys Ser
 355 360 365

Pro Lys Phe Gln Glu Thr Gly Phe Phe Lys Leu Thr Asp His Gly Leu
 370 375 380

Glu Glu Ile Ser Ser Cys Arg Gln Lys Gly Phe His Pro His Ser Lys
 385 390 395 400

Asp Pro Pro Leu Phe Cys Ser Cys Ser His Val Thr Val Val Asp Arg
 405 410 415

Ala Val Thr Ile Thr Asp Leu Arg
 420

<210> 8
 <211> 58
 <212> PRT
 <213> Homo sapiens

<400> 8

Val Gly Arg Leu Glu Asn Ala Ile Gly Trp Tyr His Ser His Pro Gly
 1 5 10 15

Tyr Gly Cys Trp Leu Ser Gly Ile Asp Val Ser Thr Gln Met Leu Asn
 20 25 30

Gln Gln Phe Gln Glu Pro Phe Val Ala Val Val Ile Asp Pro Thr Arg
 35 40 45

Thr Ile Ser Ala Gly Lys Val Asn Leu Gly
 50 55

<210> 9
 <211> 58
 <212> PRT
 <213> Drosophila melanogaster

<400> 9

Val Gly Arg Met Glu His Ala Val Gly Trp Tyr His Ser His Pro Gly

<210> 12
 <211> 58
 <212> PRT
 <213> *Archaeoglobus fulgidus*

<400> 12

Leu Pro Ile Gly Met Lys Val Phe Gly Thr Val His Ser His Pro Ser
 1 5 10 15

Pro Ser Cys Arg Pro Ser Glu Glu Asp Leu Ser Leu Phe Thr Arg Phe
 20 25 30

Gly Lys Tyr His Ile Ile Val Cys Tyr Pro Tyr Asp Glu Asn Ser Trp
 35 40 45

Lys Cys Tyr Asn Arg Lys Gly Glu Glu Val
 50 55

<210> 13
 <211> 58
 <212> PRT
 <213> *Pyrococcus horikoshii*

<400> 13

Met Pro His Asp Glu Ser Ile Lys Gly Thr Phe His Ser His Pro Ser
 1 5 10 15

Pro Phe Pro Tyr Pro Ser Glu Gly Asp Leu Met Phe Phe Ser Lys Phe
 20 25 30

Gly Gly Ile His Ile Ile Ala Ala Phe Pro Tyr Asp Glu Asp Ser Val
 35 40 45

Lys Ala Phe Asp Ser Glu Gly Arg Glu Val
 50 55

<210> 14
 <211> 58
 <212> PRT
 <213> *Thermoplasma volcanium*

<400> 14

Lys Pro Ile Asp Phe Ser Leu Val Gly Ser Val His Ser His Pro Ser
 1 5 10 15

Gly Ile Thr Lys Pro Ser Asp Glu Asp Leu Arg Met Phe Ser Leu Thr
 20 25 30

Gly Lys Ile His Ile Ile Val Gly Tyr Pro Tyr Asn Leu Lys Asp Tyr
 35 40 45

Ser Ala Tyr Asp Arg Ser Gly Asn Lys Val
 50 55

<210> 15
 <211> 58
 <212> PRT
 <213> Methanobacterium thermoautotrophicum

<400> 15

Leu Pro Pro Phe Thr Gly Ala Val Gly Ser Val His Ser His Pro Gly
 1 5 10 15

Pro Val Asn Leu Pro Ser Ala Ala Asp Leu His Phe Phe Ser Lys Asn
 20 25 30

Gly Leu Phe His Leu Ile Ile Ala His Pro Tyr Thr Met Glu Thr Val
 35 40 45

Ala Ala Tyr Thr Arg Asn Gly Asp Pro Val
 50 55

<210> 16
 <211> 58
 <212> PRT
 <213> Aquifex aeolicus

<400> 16

Ile Ser Lys Gly Met Glu Ile Val Gly Val Tyr His Ser His Pro Asp
 1 5 10 15

His Pro Asp Arg Pro Ser Gln Phe Asp Leu Gln Arg Ala Phe Pro Asp
 20 25 30

Leu Ser Tyr Ile Ile Phe Ser Val Gln Lys Gly Lys Val Ala Ser Tyr
 35 40 45

Arg Ser Trp Glu Leu Lys Gly Asp Lys Phe
 50 55

<210> 17
 <211> 60
 <212> PRT
 <213> Mycobacterium tuberculosis

<400> 17

Glu Asp Ala Asp Glu Val Pro Val Val Ile Tyr His Ser His Thr Ala
1 5 10 15

Thr Glu Ala Tyr Pro Ser Arg Thr Asp Val Lys Leu Ala Thr Glu Pro
20 25 30

Asp Ala His Tyr Val Leu Val Ser Thr Arg Asp Pro His Arg His Glu
35 40 45

Leu Arg Ser Tyr Arg Ile Val Asp Gly Ala Val Thr
50 55 60

<210> 18
<211> 58
<212> PRT
<213> Escherichia coli

<400> 18

Ile Lys Ile Asn Ala Ser Ala Leu Ile Leu Ala His Asn His Pro Ser
1 5 10 15

Gly Cys Ala Glu Pro Ser Lys Ala Asp Lys Leu Ile Thr Glu Arg Ile
20 25 30

Ile Lys Ser Cys Gln Phe Met Asp Leu Arg Val Leu Asp His Ile Val
35 40 45

Ile Gly Arg Gly Glu Tyr Val Ser Phe Ala
50 55

<210> 19
<211> 57
<212> PRT
<213> Drosophila melanogaster

<400> 19

Thr Gly Arg Pro Glu Met Val Val Gly Trp Tyr His Ser His Pro Gly
1 5 10 15

Phe Gly Cys Trp Leu Ser Gly Val Asp Ile Asn Thr Gln Gln Ser Phe
20 25 30

Glu Ala Leu Ser Glu Arg Ala Val Ala Val Val Val Asp Pro Ile Gln
35 40 45

Ser Val Lys Gly Lys Val Val Ile Asp
50 55

<210> 20
 <211> 57
 <212> PRT
 <213> Homo sapiens

<400> 20

Thr Gly Arg Pro Glu Met Val Val Gly Trp Tyr His Ser His Pro Gly
 1 5 10 15

Phe Gly Cys Trp Leu Ser Gly Val Asp Ile Asn Thr Gln Gln Ser Phe
 20 25 30

Glu Ala Leu Ser Glu Arg Ala Val Ala Val Val Val Asp Pro Ile Gln
 35 40 45

Ser Val Lys Gly Lys Val Val Ile Asp
 50 55

<210> 21
 <211> 57
 <212> PRT
 <213> Dictyostelium discoideum

<400> 21

Thr Gly Arg Asp Glu Ile Val Ile Gly Trp Tyr His Ser His Pro Gly
 1 5 10 15

Phe Gly Cys Trp Leu Ser Ser Val Asp Val Asn Thr Gln Gln Ser Phe
 20 25 30

Glu Gln Leu Gln Ser Arg Ala Val Ala Val Val Val Asp Pro Leu Gln
 35 40 45

Ser Val Arg Gly Lys Val Val Ile Asp
 50 55

<210> 22
 <211> 57
 <212> PRT
 <213> Saccharomyces cerevisiae

<400> 22

Thr Gly Arg Asp Gln Met Val Val Gly Trp Tyr His Ser His Pro Gly
 1 5 10 15

Phe Gly Cys Trp Leu Ser Ser Val Asp Val Asn Thr Gln Lys Ser Phe
 20 25 30

Glu Gln Leu Asn Ser Arg Ala Val Ala Val Val Val Asp Pro Ile Gln
 35 40 45

Ser Val Lys Gly Lys Val Val Ile Asp
 50 55

<210> 23
 <211> 306
 <212> PRT
 <213> *Saccharomyces cerevisiae*

<400> 23

Met Glu Arg Leu Gln Arg Leu Met Met Asn Ser Lys Val Gly Ser Ala
 1 5 10 15

Asp Thr Gly Arg Asp Asp Thr Lys Glu Thr Val Tyr Ile Ser Ser Ile
 20 25 30

Ala Leu Leu Lys Met Leu Lys His Gly Arg Ala Gly Val Pro Met Glu
 35 40 45

Val Met Gly Leu Met Leu Gly Glu Phe Val Asp Asp Tyr Thr Val Asn
 50 55 60

Val Val Asp Val Phe Ala Met Pro Gln Ser Gly Thr Gly Val Ser Val
 65 70 75 80

Glu Ala Val Asp Asp Val Phe Gln Ala Lys Met Met Asp Met Leu Lys
 85 90 95

Gln Thr Gly Arg Asp Gln Met Val Val Gly Trp Tyr His Ser His Pro
 100 105 110

Gly Phe Gly Cys Trp Leu Ser Ser Val Asp Val Asn Thr Gln Lys Ser
 115 120 125

Phe Glu Gln Leu Asn Ser Arg Ala Val Ala Val Val Val Asp Pro Ile
 130 135 140

Gln Ser Val Lys Gly Lys Val Val Ile Asp Ala Phe Arg Leu Ile Asp
 145 150 155 160

Thr Gly Ala Leu Ile Asn Asn Leu Glu Pro Arg Gln Thr Thr Ser Asn
 165 170 175

Thr Gly Leu Leu Asn Lys Ala Asn Ile Gln Ala Leu Ile His Gly Leu

180 185 190
 Asn Arg His Tyr Tyr Ser Leu Asn Ile Asp Tyr His Lys Thr Ala Lys
 195 200 205
 Glu Thr Lys Met Leu Met Asn Leu His Lys Glu Gln Trp Gln Ser Gly
 210 215 220
 Leu Lys Met Tyr Asp Tyr Glu Glu Lys Glu Glu Ser Asn Leu Ala Ala
 225 230 235 240
 Thr Lys Ser Met Val Lys Ile Ala Glu Gln Tyr Ser Lys Arg Ile Glu
 245 250 255
 Glu Glu Lys Glu Leu Thr Glu Glu Glu Leu Lys Thr Arg Tyr Val Gly
 260 265 270
 Arg Gln Asp Pro Lys Lys His Leu Ser Glu Thr Ala Asp Glu Thr Leu
 275 280 285
 Glu Asn Asn Ile Val Ser Val Leu Thr Ala Gly Val Asn Ser Val Ala
 290 295 300
 Ile Lys
 305
 <210> 24
 <211> 310
 <212> PRT
 <213> Homo sapiens
 <400> 24
 Met Asp Arg Leu Leu Arg Leu Gly Gly Gly Met Pro Gly Leu Gly Gln
 1 5 10 15
 Gly Pro Pro Thr Asp Ala Pro Ala Val Asp Thr Ala Glu Gln Val Tyr
 20 25 30
 Ile Ser Ser Leu Ala Leu Leu Lys Met Leu Lys His Gly Arg Ala Gly
 35 40 45
 Val Pro Met Glu Val Met Gly Leu Met Leu Gly Glu Phe Val Asp Asp
 50 55 60
 Tyr Thr Val Arg Val Ile Asp Val Phe Ala Met Pro Gln Ser Gly Thr
 65 70 75 80

Gly	Val	Ser	Val	Glu	Ala	Val	Asp	Pro	Val	Phe	Gln	Ala	Lys	Met	Leu	85	90	95
Asp	Met	Leu	Lys	Gln	Thr	Gly	Arg	Pro	Glu	Met	Val	Val	Gly	Trp	Tyr	100	105	110
His	Ser	His	Pro	Gly	Phe	Gly	Cys	Trp	Leu	Ser	Gly	Val	Asp	Ile	Asn	115	120	125
Thr	Gln	Gln	Ser	Phe	Glu	Ala	Leu	Ser	Glu	Arg	Ala	Val	Ala	Val	Val	130	135	140
Val	Asp	Pro	Ile	Gln	Ser	Val	Lys	Gly	Lys	Val	Val	Ile	Asp	Ala	Phe	145	150	155
Arg	Leu	Ile	Asn	Ala	Asn	Met	Met	Val	Leu	Gly	His	Glu	Pro	Arg	Gln	165	170	175
Thr	Thr	Ser	Asn	Leu	Gly	His	Leu	Asn	Lys	Pro	Ser	Ile	Gln	Ala	Leu	180	185	190
Ile	His	Gly	Leu	Asn	Arg	His	Tyr	Tyr	Ser	Ile	Thr	Ile	Asn	Tyr	Arg	195	200	205
Lys	Asn	Glu	Leu	Glu	Gln	Lys	Met	Leu	Leu	Asn	Leu	His	Lys	Lys	Ser	210	215	220
Trp	Met	Glu	Gly	Leu	Thr	Leu	Gln	Asp	Tyr	Ser	Glu	His	Cys	Lys	His	225	230	235
Asn	Glu	Ser	Val	Val	Lys	Glu	Met	Leu	Glu	Leu	Ala	Lys	Asn	Tyr	Asn	245	250	255
Lys	Ala	Val	Glu	Glu	Glu	Asp	Lys	Met	Thr	Pro	Glu	Gln	Leu	Ala	Ile	260	265	270
Lys	Asn	Val	Gly	Lys	Gln	Asp	Pro	Lys	Arg	His	Leu	Glu	Glu	His	Val	275	280	285
Asp	Val	Leu	Met	Thr	Ser	Asn	Ile	Val	Gln	Cys	Leu	Ala	Ala	Met	Leu	290	295	300
Asp	Thr	Val	Val	Phe	Lys											305	310	